BULLET DVR

user`s manual
Multi-Cam V2.0

BULLETDVR

Summary:

LIMITED WARRANTY

The *Bullet DVR*™ system, including parts and accessories, is warranted against defects in material or workmanship as follows:

1. LABOR: For a period of **90 days** from the date of purchase, if this product is determined to be defective, We will repair or replace the Product, at its option, at no charge. After the warranty period, you must pay for all labor charges.

2. PARTS: In addition, We will supply, at no charge, new or rebuilt replacements in exchange for defective parts for a period of **one (1) year**. After 90 days from the date of purchase, labor for removal and installation is available at your expense. To obtain warranty service, you must contact your *Bullet DVR*™ authorized dealer where the unit was purchased. Proof of purchase in the form of a bill of sale or receipted invoice which is evidence that the unit is within the Warranty period must be presented to obtain warranty service.

This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of, or to any part of the Product, including the cabling. This warranty does not cover damage due to improper operation or maintenance, connection to improper voltage supply, or attempted repair by anyone other than a facility authorized by *Bullet DVR*™ to service the Product. This warranty is invalid if the factory applied serial number has been altered or removed from the Product.

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. *BULLET DVR*™ SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

Checking the supplied items:

Make sure that you have the following items supplied with your Bullet DVR kit:

10

5 + 6

1+3+4

9

8

11

7

2

12
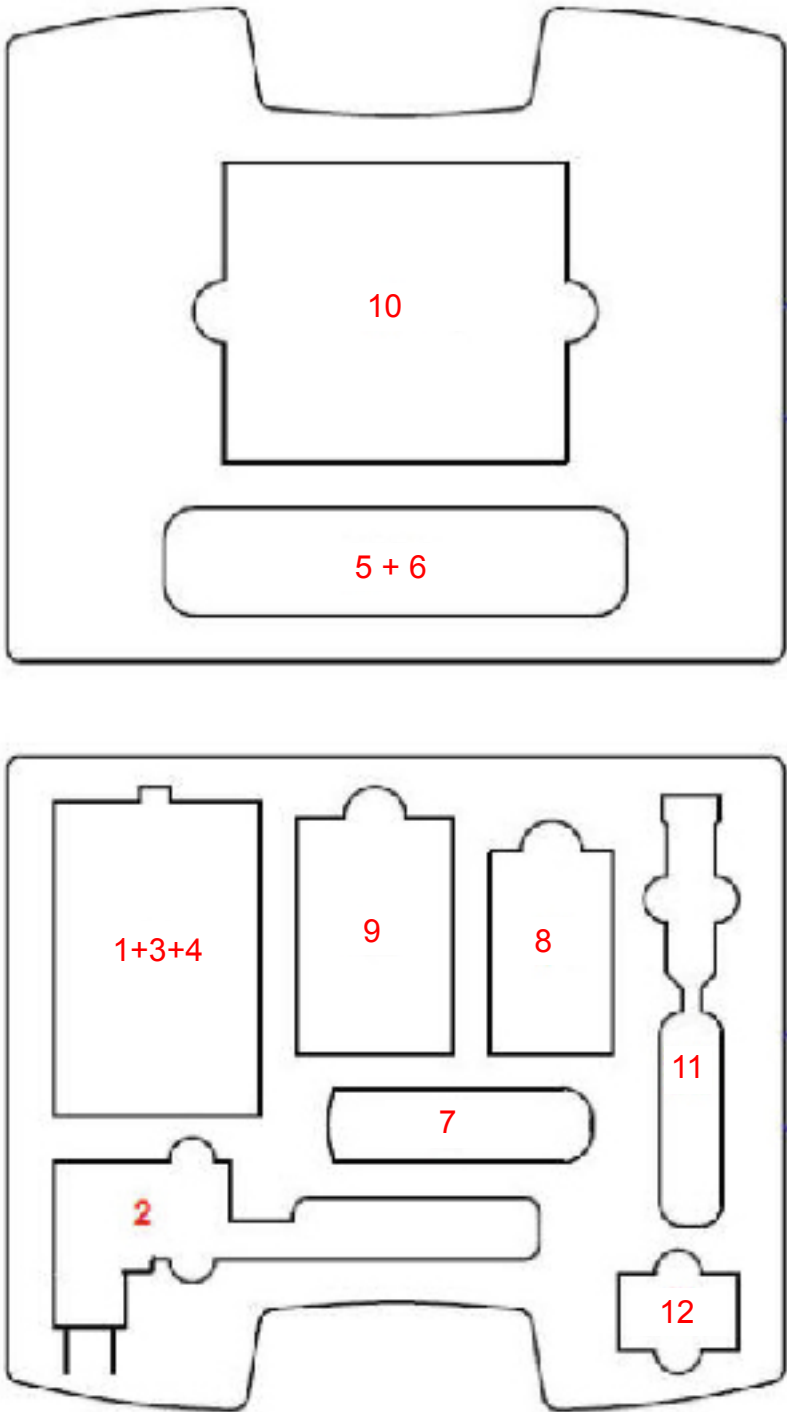
❶ Core unit

❷ AC Adapter
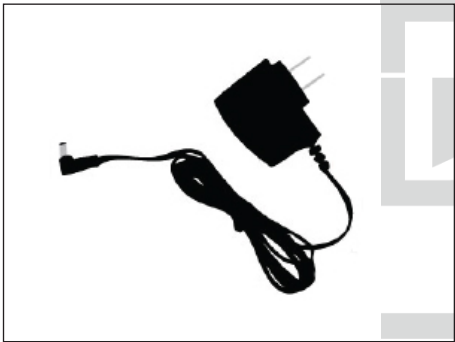
❸ Compact Flash (CF) Memory Card (inside unit)

❹ PCMCIA-to-CF Adapter (inside unit)

❺ 12VDC Power Cable

❻ A/V Cable

❼ Infra-red (IR) Receiver
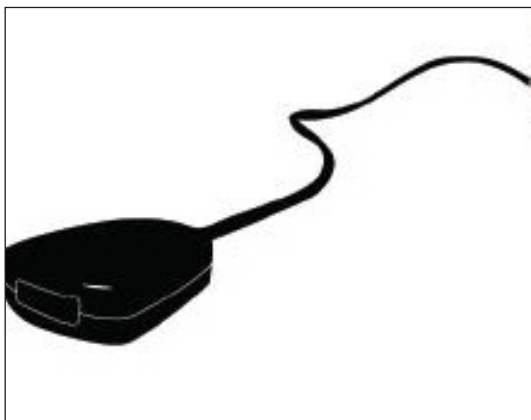
❽ IR Remote Control

❾ Quick-Release Bracket

❿ PC Software

⓫ Bullet Camera

⓬ Anti-Vibration Camera Mount

Checking the minimum PC requirements:

In order to install the configuration software and to playback your video files, make sure that your computer meets the following minimum requirements:

- Pentium III processor and above, 1Gb or faster
- 512Mb of RAM memory
- Windows 2000 (sp4), XP (sp2) or Vista operating system
- 7200 RPM Hard drive
- 10Gb of free Hard Drive space
- Color monitor, 1024x768 resolution or higher
- DirectX 9.0c display adapter or latest
- PCMCIA (PC card) or CF card slot or Card Reader

Understanding the buttons and functions:

FRONT:

❶ Eject button
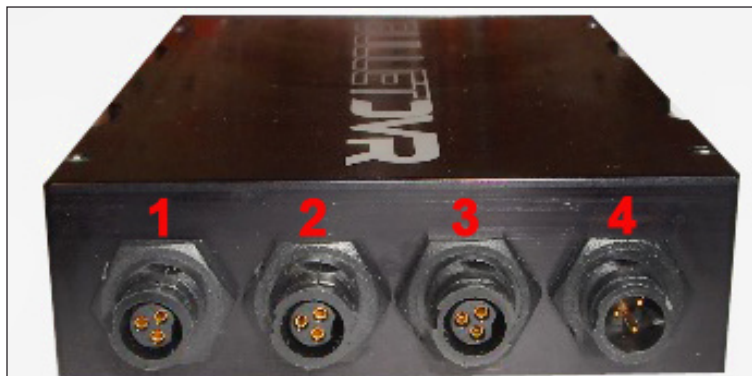❷ CF card compartment
❸ Status light

LEFT SIDE:

❶ LANC
❷ A/V

RIGHT SIDE:

❶ Infra-red
❷ MIC

BACK:

❶ Camera 1
❷ Camera 2
❸ Camera 3
❹ Power

Quick-Start Guide:

Your *Bullet DVR* has been fully tested at the factory, prior to shipping. The CF card and adapter are already inserted inside the unit, which is pre-configured and operational right out of the box.

Step 1: Connect the **12VDC Power cable** to the source battery, making sure the polarity is correct.
Step 2: Connect the Bullet Camera to one of the **CAM** inputs at the back of the unit.
Step 3: Plug-in the Infra-red receiver to the **IR** jack on the side of the unit.

Step 4: Plug-in the Power Cable to the **POWER** jack on the unit. Initialization will start and the DVR is ready to record once the **status light** remains steady green.

Step 5: Press the **REC** button REC on the wireless remote to start recording.

Connecting a camera to the DVR:

The quick-connect, waterproof connector fitted on the Bullet Camera can only mate with the **CAM** plug on the DVR if they are aligned correctly. Once aligned, push them together fully and then twist the connector **90 degrees** to the right, in order to lock the barrels. To release, simply grab the barrels again and twist to the left, then pull them apart.

Bullet DVR Operation:

1. Press the **REC** button REC to start recording a new video file.

2. Press the **Stop** button ■ to end the recording.

3. Disconnect the **Power Cable** before removing the **CF card** from the unit.

4. Insert the **CF card** into the **computer** to playback your videos.

Safety and Warning:

o Never insert or remove the **CF card** from the unit while power is applied.
o There are no user serviceable parts inside, please do not open the unit. If you require service, please contact your dealer.

o Do not remove or tamper with the Serial Number sticker located on the side of the unit. Doing so will void your warranty.

Ejecting the CF memory card:

1. Wait until the **Status LED** turns to steady green.

2. Disconnect the **12VDC Power Cable** or **AC Adapter.**

3. Firmly press the **Eject button** and grab the **CF card adapter** by the edges and pull it out of the unit.If you have problems reaching the card, there are 2 small holes on each side of the adapter, which you can grab with a sharp object and pull out.

Caution:

Once recording has stopped, it takes a short time to save the buffered data to the memory card.The Power Cable or AC Adapter should **NOT** be disconnected until the **LED status light** turns to steady **green**. Ejecting the CF card too early could damage the integrity of the video file and ruin your recording session.

Video file name:

Recorded video files are stored on the **CF memory card** with the prefix **DVR_** by default, and can be changed by the user. The maximum number of files on the same CF card is 1000, starting with DVR_000.avi and is incremental to DVR_999.avi

Compatible Compact Flash memory cards:

Currently, the *Bullet DVR* unit supports the following brands of CF memory cards:

> o Sandisk Ultra & Ultra II
> o Sandisk Extreme III & Extreme IV
> o Transcend 133x
> o A-Data 133x & 266x
> o Lexar 80x

There are other brands which might work, but have not yet been tested for compatibility. The minimum speed rating of the card should be 60x, otherwise your videos could appear choppy.
The bigger capacity the card is, the faster rating you should use.
Contact your *Bullet DVR* dealer for more information.

Bullet DVR Status Light:

> o **Steady Green** = Unit is in Stand-by mode, ready for operation.
> o **Quick-Flashing Red** = Unit is recording normally.
> o **Slow-Flashing Red =** Unit is recording, but no video source is detected.
> o **Flashing Yellow =** Compact Flash memory card is full.
> o **Flashing Yellow (4 times) =** Low battery, recording will stop and unit will enter sleep mode.
> o **Steady Yellow =** Unit is in sleep mode, press & hold the **stop** button for a few seconds to wake it up.

Playback of the video recordings:

Playing back your recorded videos on the CF memory card is simple. **Windows Media Player** can handle all video files generated by the *Bullet DVR*, as long as the required **codec** is installed on your PC. Simply insert the **PCMCIA adapter** including the CF card into your laptop, or just put the CF card directly into a **CF card reader.** Media Player will start playing the file automatically. It is highly recommended that you copy the video file to your computer's hard drive first, for faster and smoother playback.

About the required codecs:

To playback video files encoded using **Mpeg-4** compression, your computer needs to have the **DivX codec** installed first. If you don't already have it installed on your PC, you can find it on the included software CD. For files encoded with **Mpeg-2**, you'll need to have any Mpeg-2 codec installed on your computer, if you want *Windows Media Player* to be able to playback those files. If you install any software to watch DVD movies on your PC, it will automatically install the Mpeg-2 codec.

Playback using VLC Media Player:

Alternatively, you can install the free software **VLC Media Player** included on the software CD. This program is similar to the *Windows Media Player*, but is free of charge and already has full support for Mpeg-2 and Mpeg-4 DivX video files.

Software installation:

The *Bullet DVR* installation software can be launched by inserting the included **software CD** in your computer's **CD player**, and selecting **Configuration Utility** from the list. Follow the on-screen instructions for the installation procedure.
After you are done installing the software, you can start the configuration utility normally from the Windows **Start program** menu, or from the program shortcut on your desktop.

Optionally, You may also install the **VLC Media Player,** as well as the **Track Timer** software for racing. These programs are brought to you as extra tools for the *Bullet DVR* unit, but we do not provide any support in case of problems. Please contact VLC or Track timer's customer support directly for help. We can only offer support for the *Bullet DVR* **Configuration utility.**

Using the Anti-Vibration camera mount:

For quick and easy installation of your **Bullet Camera**, always use the supplied **Anti-Vibration** camera mount. Follow these steps for the best results:

1. Find the best location for mounting your camera. It can be anywhere on the **vehicle,** or on your **helmet.** Make sure the surface is clean and there is no oil or grease residue. Apply a piece of **Velcro** to the surface.

2. Insert the Bullet Camera in the mount, and then fix the mount to the Velcro base.

3. Using your fingers, grab the rear end of the camera and rotate it inside the mount, to align the image correctly. The **BULLET DVR** logo on the camera marks the **top** of the screen, and the 2 small **dots** on the mount mark the center. Align the logo with the dots to position the camera properly. For an easier, live monitoring of the image position, refer to the chapter *AV/ OUT monitoring.*

Align logo with these dots

Installing the Quick-Release Bracket:

When using the *Bullet DVR* in **motorsports** and other **harsh** environments, always mount it on the vehicle using the supplied **Quick-Release bracket.** The bracket helps to minimize vibrations and will hold the **DVR** securely at all times. Failure to properly mount the DVR in the bracket could result in damages to your equipment, please follow these steps carefully:

1. Attach the base plate to a flat surface on the vehicle, using the **4 rivets.** Mark the 4 corners of the bracket and drill the receiving panel. If the thickness of the panel is greater, you may use longer rivets than the ones supplied with your kit. Note the orientation of the bracket with the word **"TOP"** located on the hinges side.

2. Place the *Bullet DVR* unit on the base plate, aligning each of the **4 grooves** with the **4 tabs** found on the bracket. Make sure the logo on the DVR is oriented correctly with the **"TOP"** marking, which is the side with the metal hinges

**3.** Attach the **top** plate to the **bottom** plate, using the metal hinges.

4. Lock the *Bullet DVR* unit in the bracket, using the **Quick-Release pin.** Align the pin holes and push the pin all the way in, until the **locking ball** is visible on the other side.

Configuring the unit:

When you power up the *Bullet DVR,* the unit will look for the file **device.ini** located on the root directory of the memory card. This file contains all the parameters configured by the user. When using for the first time, it will load up the default settings from the factory. If no **device.ini** file is found, the unit will use the last known configuration.
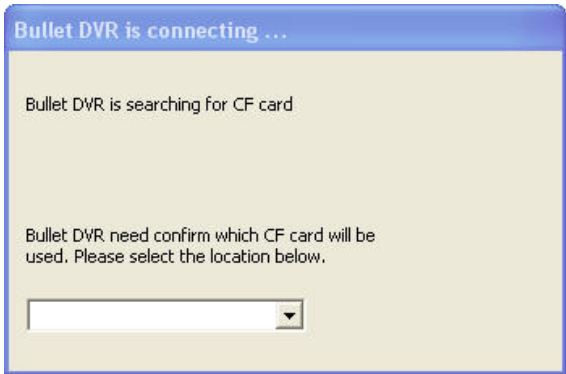
Using the Bullet DVR Configuration utility:

Before you start the program, make sure the **Compact Flash memory card** is already inserted into the computer or card reader. Your computer will prompt you to select the drive where the CF card is located. Once the card is detected, the utility will launch. You will see a number of icons at the top of the screen. Each of these icons correspond to a different section of the software.
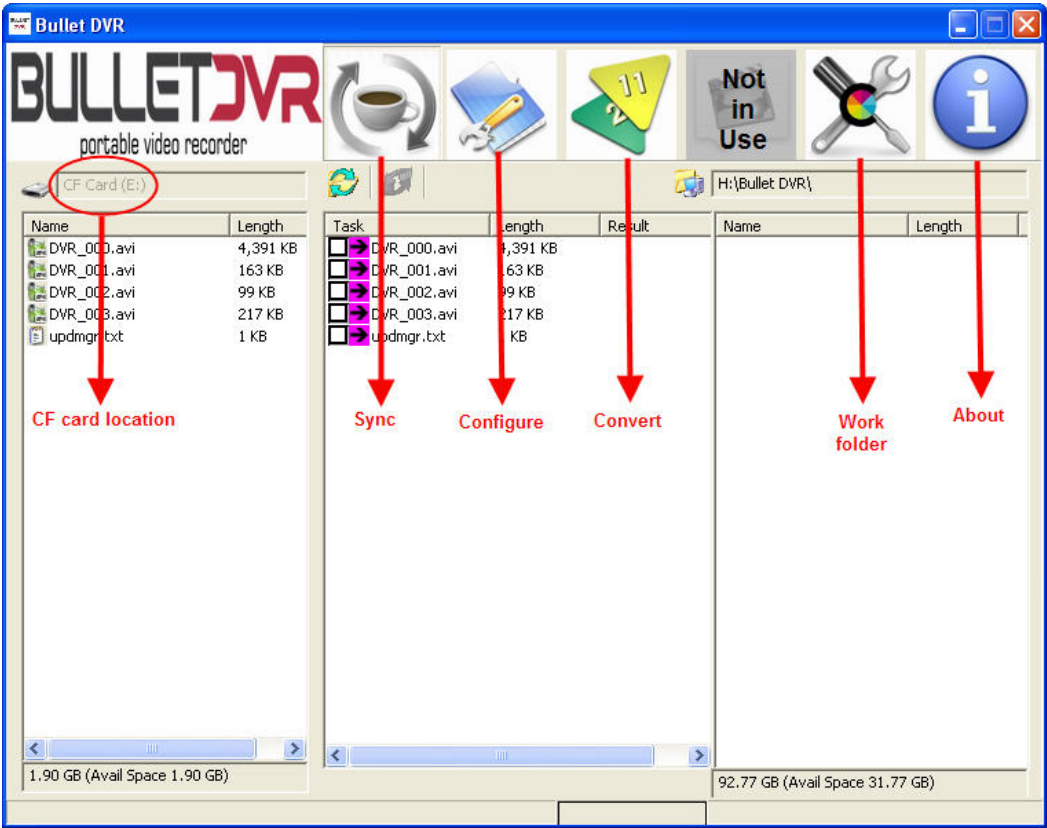
CF Card Location: Displays the source path and all the video files contained on the current CF memory card. In this example, the source files are located on the E: drive of the computer.

Sync: Click on this tab to synchronize the contents of your CF card with the contents of your PC's hard drive. This is useful when you have many files recorded on the same memory card, as it will only transfer the ones which aren't already stored on your computer.

To synchronize the files, check the box next to each file you wish to upload, then click on the **synchronize** button to start the process. Any selected file which is not already present in your **work directory**, will be copied to this location.

Configure: This tab will take you to the various configuration settings available and allow you to change the many parameters of the **DVR**. When you open the **configure** section, you will be presented with 6 more sub-categories, all of which let you further define the settings. Make sure to click on the checkbox ✔ after you are done making changes, to register your new settings and close the opened window.

Click on the Cancel box ✕ to close without saving.

System

Video Standard: Change the video standard for different countries. **NTSC** is used primarily in the *USA* and *Canada*, while **PAL** is used mostly in *Europe.* There are other standards available, which you can select by using the pull-down menu on the right side.

Recording Setting: There are 3 modes available, used for different purposes. **Normal** mode is selected by default, and intended for most users. The other two **cycle** modes are generally used for other applications, such as surveillance video.

Normal mode records continuously, but the file size limit is **2Gb**. When this limit is reached, a new file will be created on the **CF memory card,** starting from where the previous file ended. You can store as many files as the capacity of the CF card is able to hold. During post-production, you can simply place each file one after the other to create one large continuous video.

Cycle (Single File) records continuously, but when the **2Gb limit** is reached, it will **overwrite** the current file, starting from the beginning. You cannot store more than one file with this setting, so if the CF memory card is bigger than 2Gb, you will not be able to use it completely.

Cycle (Disk) is similar to **Normal** mode, and will record many files of **2Gb** maximum each, one after the other. Except once the total capacity of the card is reached, it will overwrite the previous files, starting with the oldest recording on the card.

Warning: When the *Bullet DVR* is set to **Cycle** recording mode, any video file already present on the CF memory card will be deleted at startup.

Only Record Key Frame is for video surveillance applications, where a very long recording time is required. When selected, the *Bullet DVR* will record only 2 frames for every second of video (NTSC). When PAL standard is selected, it will record 3 frames for every 2 seconds of video.
This option will not record any audio, and can only record in mpeg-4 mode.

Audio Source: Allows you to change how the sound will be recorded. **Line-In** is not currently supported. **External Mic** is for using an optional Stereo microphone, connected to the MIC jack.

Internal Mic will record from the internal microphone inside the *Bullet DVR* unit (Mono recording).

The **Low** and **High** slider bar is for adjusting the sensitivity of the microphone.

LCD Display are the 2 lines of text that will appear on your TV or monitor, when the DVR is connected via the A/V cable

Enable Beep/Vibration: When selected, the unit will emit an **audio** alert whenever the status of the DVR changes, such as record, stop, etc. The **vibratio**n feature is not currently supported.

Record on Power On: Allows the unit to automatically start recording, whenever power is applied, without having to press any buttons. You only need to press the **Stop** ⬛ key when finished.

File prefix: Defines the name of the recorded file on the CF memory card. The default name is **DVR_ xxx.avi** and is incremental from **000** to **999**, for a total of **1000 files maximum** on the same CF card. You may change the default name at any time.

CAM Voltage: Allows you to determine the voltage sent to the external **Bullet Camera.** It is recommended to leave it on **10V** so that the cameras will run cooler.

Motion Detect is not currently supported.

Recording
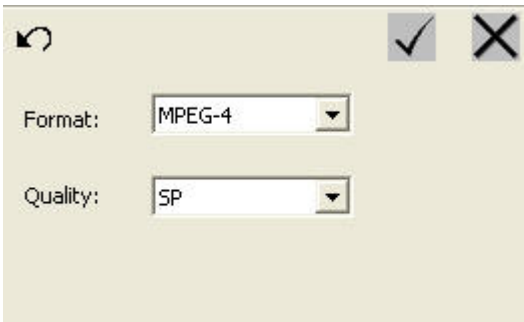
Format: Select the **MPEG-4** format for videos intended for use on the internet, website, streaming server, etc. This format is widely popular and supported by many media players. Select **MPEG-2** to record in a format better suited for making movies in high resolution, when the final contents is to be distributed on **DVD discs.**MPEG-2 is an industry leading format which provides a very high level of details and accuracy.

Quality: The **recorded file size** depends on the complexity of the moving objects and background. Slow moving objects or still backgrounds will usually generate a smaller file size, while fast moving objects require more memory storage. The following recording times are an estimation based on this explanation:

MODE	SPEED	DURATION (For 1Gb)
LQ	1 Mb/s	80 minutes
EP	2 Mb/s	60 minutes
LP	4 Mb/s	40 minutes
SP	6 Mb/s	20 minutes
HQ	8 Mb/s	15 minutes

Picture

Picture Adjustment: You can adjust the **brightness**, **contrast** and **saturation** of the picture to get the best quality for any given environment. The default value is **50%.**

OSD

OSD: Click this tab to configure the **On-Screen Display** (OSD) which is the **information** to display on the screen, over the recorded video. When this option is **disabled** there will be no information printed over the recorded video. This is referred to as **timestamp**, and is used for video surveillance applications. There is another configurable **OSD** screen, which you can find in the **Laptimer** section.

Lap Timer

Lap Timer: Click this tab to configure the lap timer options.

Enable Lap Timer: When you check this box, the lap timer feature will become active and you will be able to record the lap times along with your videos. The **IR receiver** needs to be connected to the *Bullet DVR* unit, and a compatible **beacon** (not included) must be positioned properly on the side of the racetrack which faces the receiver.

On Screen Display: When enabled, the lap timer information will appear on screen, over the recorded video. You can change the location where the information will be displayed, using the **Display Position** window below.

Split Signal Same as Beacon: Select this option when you need to setup **split** timing, when you only have **main beacons** available. This will let you use the same **IR frequency** for both main and split beacons, the only difference being that the first beacon will be automatically recognized as the main unit, and all others will be set as **split.**
If you want the *Bullet DVR* to differentiate between the main beacon and other split beacons, you will need to purchase true **split beacons,** and disable this option.

Display Summary after Stop: When enabled, the OSD information will be displayed briefly at the end of your recorded video.

Split Count: Allows you to select the number of **split beacons** which are positioned on the racetrack. The maximum allowed is one main beacon and up to 4 split beacons.

Mask Time: Set the amount of time where the lap timer will be inactive, so that the IR receiver does not pick-up the signal of another beacon positioned nearby.

Display Position: Allows you to manually set where the **Lap Timer** data will be displayed on your **TV screen.** The coordinates are defined horizontally by the **X** value and vertically by the **Y** value. The numbers correspond to the number of pixels which are visible on the screen:
NTSC = 720x480 pixels (X value can be set from **0** to **720, Y** value **0** to **480)**
PAL = 720x576 pixels (X value can be set from **0** to **720, Y** value **0** to **576)**

Driver Information: Configure the 4 fields to change the names and information related to the recorded event, for later reference.

About the Lap Timer feature:

o The **Driver Information** fields and **Lap times** will be saved to the **CF memory card,** in the file named **DVR_xxx.txt** The file name may differ, if the user changed the default file name in the program.

o When the **Lap Timer** option is **enabled**, the **Time Stamp** option will be automatically turned off. They cannot work both at the same time.

o The **Lap Timer** feature (when set to **enabled**) will start to work whenever the **IR receiver** crosses the path of a compatible **beacon**.

o The *Bullet DVR* can record a **maximum** of **129** Lap Times for any given recording session.

o The *Bullet DVR* unit is compatible with the main signal beacons from *AIM, Alfano, XT Racing* and many more who use the same **IR signal.** For **split times** support, you can use the *XT Racing* split time beacon (up to 4 split beacons added).
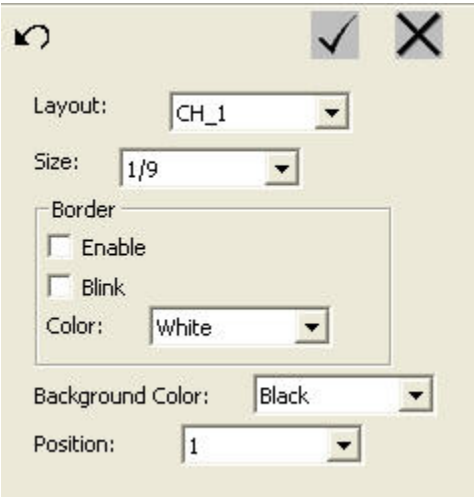
The **3 Channel** tab is for the configuration of the screen display, when more than one bullet camera is connected to the DVR. There are many various combinations possible, which gives you a lot of flexibility for creating some very interesting images.

Layout: The Layout parameter lets you decide how you want to configure the video recording. There is a maximum of 3 cameras connected to the DVR simultaneously, and you can configure and position each one as needed. Keep in mind, no matter how many cameras are connected, there is only one recorded file that will be generated. You can overlay one, two or three cameras on the same screen, but the video of each camera will not be recorded separately for each camera. They will all be displayed on the same screen, in the same manner that you select from the **layout** parameter.

The first 3 options **CH_1, CH_2** and **CH_3** correspond to the **camera inputs 1, 2** and **3** accordingly. When you select it, the recorded image will be the full screen image of the selected camera.

PIP stands for **Picture-in-Picture.** When you select this option, it will create another video in a smaller window, which will be overlayed over the full screen of the first video feed. The size and position of the PIP window can be adjusted to suit your requirements. **CAM1** will be displayed in **full screen,** and the image from **CAM2** will be displayed in the **PIP**.

PIP-2 creates two **PIP** windows, which will be positioned at the **top** of the screen, one on each side. Their position is not configurable, but you can adjust their size. The full screen from **CAM1** will be shown, while **CAM2** will be the **left** side PIP, and **CAM3** will be the **right** side PIP.

PIP-2-B creates two **PIP** windows, which will be positioned at the **bottom** of the screen, one on each side. Their position is not configurable, but you can adjust their size. The full screen from **CAM1** will be shown, while **CAM2** will be the **left** side PIP, and **CAM3** will be the **right** side PIP.

H-SPLIT separates the screen into **two video inputs,** shown side-by-side. The **left** view is from **CAM1,** while the **right** view is from **CAM2.** This mode will shrink both video inputs by a small margin, and some empty space surrounding the videos will be created.

V-SPLIT separates the screen into **two video inputs,** one over the other. The **top** view is from **CAM1,** while the **bottom** view is from **CAM2.** This mode will shrink both video inputs by a small margin, and some empty space surrounding the videos will be created.

PIP-3 creates 3 PIP windows of the same size, on the same screen. You can change their size, but not their position. **CAM1** will be displayed on **top,** while **CAM2** will be at the **bottom left** side and **CAM3** at the **bottom right** side.

PIP-3-B creates 3 PIP windows of the same size, on the same screen. You can change their size, but not their position. **CAM1** will be displayed at the **top left** of the screen, while **CAM2** will be at the **top right** and **CAM3** at the **bottom middle** position.

The **Size** parameter allows you to change the size of the PIP window. There are 3 possible sizes you can choose from: **1/9, 1/6** or **¼** the total size of the full screen.

When the **Border** option is enabled, each PIP window will be framed. The frame color can be changed or you can also make the frame blink, by selecting each checkbox accordingly.

The **Background color** refers to the color of the **empty space** in-between each PIP window. You can choose between black, blue and some shades of gray.

The **Position** parameter if for configuring the position of the PIP window on the screen. The position can be set anywhere from 1 to 9, according to the following diagram:

1	2	3
4	5	6
7	8	9

Convert:

Click this tab to use the file conversion utility, when you need to convert raw **mpeg-2** files into a suitable file format for PC. You do not need to convert files recorded with the **mpeg-4** format.

H:\Bullet DVR\

File Infomation
File Name:
File Length:
Estimate Replay Time:
Version:
First Frame Offset:
First Frame Number:
Last Frame Offset:
Last Frame Number:

Video Information
Format:
Framerate:
Resolution:
Bitrate:

Audio Information
Format:
Samplerate:
Channels:
SampleBits:

☐ Auto convert after select source file

☐ Auto quit after conversion

Click the icon to browse and select the **mpeg-2** file you wish to convert. Any file recorded using the mpeg-2 format will be saved on the memory card, with a **.CSF** extension. After you select the source file to convert from the CF memory card, detailed information about the mpeg-2 recording will be displayed. Below is an example of how it will look:

H:\New Videos\DVR_003.csf   H:\Bullet DVR\DVR_003.mpg

File Infomation
File Name: H:\New Videos\DVR_00
File Length: 14.426587 MB (151066
Estimate Replay Time: 0:00:19
Version: CSF1
First Frame Offset: 0x808
First Frame Number: 0
Last Frame Offset: 0xE65CE2
Last Frame Number: 576

Video Information
Format: MPEG2
Framerate: 29.97
Resolution: 720 x 480
Bitrate: 8 M

Audio Information
Format: ADPCM
Samplerate: 48K
Channels: 2
SampleBits: 4

☐ Auto convert after select source file

☐ Auto quit after conversion

Click the icon to convert the file you just selected. The new converted file will be saved in your **work folder,** under the same name but with a new **.MPG** file extension.
If you check the **Auto Convert** option the conversion process will begin automatically, after you select the source file.
If the **Auto Quit** option is enabled the *Bullet DVR* application will be terminated, after the conversion process is completed.
For better performance, it is recommended that the **source file** remains on the **CF memory card,** and the **target file** of your **work folder** is located on the local **hard drive** of your computer.

Advanced Configuration: Allows you to change the **path** of the **work folder.** This folder contains all your converted mpeg-2 files, as well as any mpeg-4 files you might have copied using the **synchronize** feature of the program. In the example below, the current location of the work folder is **H:\Bullet DVR**

PC work directory: H:\Bullet DVR\

To change the **destination path,** click on the [...] button and select the new **work folder** from your computer's hard drive.

The **Startup Search** button should be set to **CF Card Only.**

Startup search: CF Card Only

About: Displays information about the current software and firmware versions. This is useful when you need technical assistance, so you can relay the exact product version you are using. The information appears as in the example below:

BULLET DVR	Bullet DVR Desktop Software	Version 2.0.3
	Bullet DVR Firmware	2008-11-27 or New
	Copyright (C) 2006-2008	
	Bullet DVR	
	http://www.bulletdvr.com	

Saving your profile:

After you make any changes to the **configuration file,** you must **save** the new parameters in order to make them effective. Click on the **Save All Profile** icon 🖫 to do so. By default, the first profile name is **Profile0** and you can change its name by clicking on the **Rename Current Profile** icon .

You may add a new profile by clicking on the **Add New Profile Item** icon .This is useful if you want to keep more than one set of pre-configured profiles to use for different applications, without having to reconfigure the unit every time. You can quickly change from one profile to another, by selecting it from the **pull-down menu** on the right 1st: Profile0 . If you want to reset a profile back to its default settings, load up the profile and click on the **Reset** icon .

If you need to delete a profile from this list, click on the **Delete Current Profile** icon ✕ . If you click on the **Reload Last Saved Configuration** icon , the program will load up the latest saved configuration file **device.ini**. If you click the **Backup and Restore icon** , you can import or export a configuration file.

Configuration via AV-OUT:

It is also possible to change the configuration of the *Bullet DVR* unit, using the **wireless remote control** while connected to an external **TV** or **monitor**. This allows you to preview your camera's position and screen layout live, without having to record a short clip and play it back on your PC.

Start by connecting the supplied cable to the **A/V jack** on the DVR, and the remaining **2x RCA plugs** into any available **A/V input** from your TV. The yellow plug is for video, and the white plug is for audio. Your TV will need to be set to **LINE IN** mode in order to view the feed from the DVR unit. Note that the DVR cannot power your TV or monitor, which needs to be powered on separately.

Point the wireless remote at the IR receiver, and press the Menu key MENU once. All the available configuration parameters will appear on the TV screen, which are:

- o Video
- o Audio
- o Record
- o OSD
- o System
- o 3 CH
- o Beacon

You can easily navigate and configure each of these sub-menus, using the wireless remote controller's **arrow keys**

and pressing **the OK key** OK to select any parameter. If you enter the menu and no key is pressed within **8 seconds,** you will exit the menu automatically and will need to press the menu key again to re-enter it. Pressing the **left arrow key** within the menu will take you back one step.

When a **Bullet Camera** is connected to any one of the three **CAM** inputs while the A/V cable is hooked up to your TV or monitor, you will be able to view a live image from the selected camera input.

You can quickly change the selected CAM input by pressing

the **PIP key** on the remote, followed by any of the **numbered keys** from 1 to 3. For example, pressing the PIP key followed by the #2 key would make the full screen image from CAM2 appear on your monitor. This let you easily jump from one camera to the other, and adjust the image as you require. Then you can go into the **3 CH** configuration menu and setup the **Picture-in-Picture** combination you desire.

Note that when configuring the unit via the **AV-OUT,** you do not have access to all the parameters found within the **PC configuration software.** There are more parameters available when you configure the unit using the software, but the most used ones are available via the AV-OUT menu. Below is the actual AV-OUT configuration menu structure:

Menu	Menu item	Parameter
Video	Standard	• NTSC • NTSC-433 • PAL • SECAM
Audio	Source	• Line in • Ext Mic • Int Mic
	Gain	• Lowest • Lower • Low • Medium • High
Record	Format	• Mpeg-2 • Mpeg-4
	Quality	• LQ • EP • LP • SP • HQ
	Auto Rec	• Disable • Enable
	Profile	• Load profile
OSD	Stamp	• Disable • Enable
System	Date	• 00-00-00
	Time	• 00:00:00
	Beep	• Disable • Enable
	CAM Volt	• 5V to 12V
	Power Off	• Disable • 5 Mins • 10 Mins • 15 Mins
	Connect	• Direct • LAN
3 CH	Layout	• CH_1 • CH_2 • CH_3 • PIP • PIP-2 • PIP-2-B • H-SPLIT • V-SPLIT • PIP-3 • PIP-3-B
	Border	• Enable • Disable
	Blink	• Enable • Disable
	Color	• Black • Low grey • High grey • White
	Size	• 1/9 • 1/6 • 1/4
	Position	• 1 to 9
	PadColor	• Black • Low grey • High grey • Blue
Beacon	Laptimer	• Enable • Disable
	Mask Time	0 to 99 secs
	As Split	• Yes • No
	Splits	• 0 to 4
	Sysclock	• True up

Firmware Upgrade:

A **firmware** is a small program which is built inside the unit. The firmware of the *Bullet DVR* can be upgraded if necessary, sometimes to fix known bugs or issues, and sometimes to add new features to the unit. When you power up the device, the *Bullet DVR* searches on the **CF memory card** for the two core image files: **osd.img** and **image.2510.img.** These files can be downloaded for free from www.bulletdvr.com. If they are found, the firmware upgrade will begin automatically. If they are not present, the device will load up the last known configuration. Please follow the firmware upgrade instructions very carefully, as failure to do so could cause hardware failure and render the unit inoperable.

1. Format the CF memory card using the **FAT32** file system.

2. Copy the image files **osd.img** and **image.2510.img** to the root of the memory card.

3. Launch the *Bullet DVR* configuration utility and set all the parameters as required, then make sure to save the **device.ini** file to the root of the card.

4. Insert the CF memory card into the *Bullet DVR* unit.

5. Turn on the power using the **AC wall adapter**.

6. After the unit is turned on, and the image files are found, the firmware upgrade will begin automatically. The LED status light will change colors, and audio beeps will be audible. This procedure takes a few minutes to complete. Do NOT turn off the power during this time!

7. After the upgrade is completed, the *Bullet DVR* will reboot automatically.

8. When you hear the audio signal and the LED light remains **steady green** for some time, the upgrade process is complete.

You may now unplug the AC adapter and remove the memory card. Insert it in your PC computer, and the file **updmgr.txt** should be on it if successful. You can delete the 2 image files from the card.

Optional Items:

LANC remote control: REM-01

Your *Bullet DVR™* supports all known versions of the **LANC** protocol. You can use any brand of LANC remote control to trigger **Power On/Off** and **Recording On/Off** without having to press the buttons on the control panel. A very convenient status light on the remote control lets you know the status of the recorder by flashing and changing colors.

NOTE: Do not plug or unplug the LANC remote control whenever power is applied to the unit. Make sure to always turn off the power before attempting any connections to the LANC socket, or you risk damaging the unit.

Dual-Cam Switch: DCS-01

You can wire two cameras simultaneously to the same **CAM input,** with the use of the **Dual-Cam switch**. The switch is panel-mounted and held in place with a lock-nut, so it can be mounted on a dashboard or anywhere you require, by drilling a small hole in the panel.

Handle-Bar Switch: HBS-01

This switch is the same as **DCS-01**, with the addition of a handlebar adapter made from CNC machined aluminum, designed to be mounted on the handlebar of any bike or motorcycle, size **7/8" (22mm)**. It allows you to toggle switch between two cameras, without removing your hands from the controls**.**

Extension cable: EXT-XX

If you need to extend the length of the **waterproof** video cable from your Bullet Camera, or Dual-Cam Switch, you may purchase a *Bullet DVR* waterproof **extension cable.** They are available in various lengths, to suit any applications.

EXT-00 (50cm), EXT-01 (100cm), EXT-02 (200cm), EXT-03 (300cm), EXT-05 (500cm).

Bullet Camera Lens: BCL-XX

All of our Bullet Cameras come standard with an optical lens of 3.6mm, which provides a 92 degree angle-of-view. This lens can be replaced quickly and easily, without the need for special tools. They are available in a multitude of sizes, to help you achieve that great shot you are looking for.

BCL-00 (2.9mm), BCL-01 (4,3mm), BCL-02 (6.0mm), BCL-03 (8.0mm), BCL-04 (16mm).

Protective Glass: GLA-01

This replacement glass is custom fit for all of our Bullet Cameras. It is cut from a high quality, non-reflective glass and will come in handy after your camera glass is scratched or broken, over time or after hitting a rock or some debris on the track.
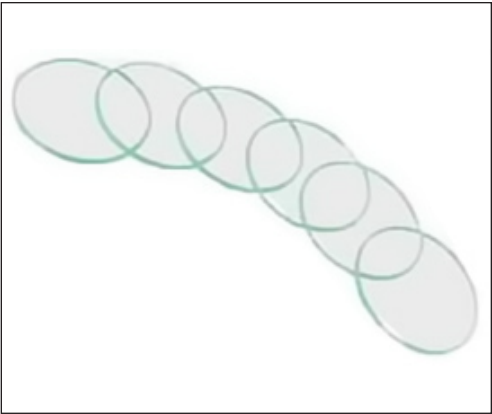
Stereo Microphone: MIC-02

This microphone plugs directly into the **MIC jack** of the DVR unit, and allows you to capture audio externally, instead of relying on the built-in microphone of the unit. It's a great addition for when the DVR is mounted far away from the sound source, or just to upgrade the standard mono recording to a 2-channel stereo sound. The standard cable length is **110cm (40 in.)** and can be extended easily, using the **LLE-XX** extensions.

Laptimer / LANC Extension Cable: LLE-XX

This cable will extend the maximum length of your Laptimer or LANC remote control. Both devices use the same cable, and can be ordered in various lengths. Features a straight 2.5mm connector on one end, and a right-angle 2.5mm on the other end.

LLE-00 (30cm), LLE-01 (100cm), LLE-02 (200cm), LLE-03 (300cm), LLE-05 (500cm)

BULLETDVR

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